

WHAT IS CLAIMED IS:

1. A fuel cell system, comprising:

a fuel cell;

5 a gas supply-discharge portion for supplying the fuel cell with a gas used in power generation conducted thereby or discharging an exhaust gas from the fuel cell; and

a controller that determines the presence/absence of a freeze among specific portions or components of the fuel cell system including the gas supply-discharge portion at the time of starting up the fuel cell system, and prohibit the start of the fuel cell system when a
10 freeze is detected in the gas supply-discharge portion even if it is only partially frozen.

2. The fuel cell system according to claim 1, further comprising a temperature detector for detecting a temperature in at least one of the portions or components of the fuel cell system, wherein the controller is adapted to determine the presence of a freeze if
15 the temperature detected by the temperature detector is below a reference value.

3. The fuel cell system according to claim 1, further comprising a pressure detector for detecting a pressure at the gas supply-discharge portion, wherein the controller is adapted to determine the presence/absence of a freeze on the basis of the pressure detected
20 by the pressure detector.

4. The fuel cell system according to claim 3, wherein the controller is further adapted to determine the presence of a freeze if the pressure detected by the pressure detector is out of a predetermined range.
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5. The fuel cell system according to claim 3, further comprising an adjustment mechanism disposed in the gas supply-discharge portion to adjust the supplied or discharged amount of gas, wherein

the controller is adapted to determine the presence/absence of a freeze on the basis of
30 a change in the pressure detected by the pressure detector when operating the adjustment mechanism.

6. The fuel cell system according to claim 1, further comprising an electrically driven component for the supply or discharge of gas which is disposed in the gas supply-discharge

portion, wherein

the controller is adapted to determine the presence/absence of a freeze on the basis of an electric power supplied to the electrically driven component.

5 7. The fuel cell system according to claim 1, further comprising an electrically driven component for the supply or discharge of gas which is disposed in the gas supply-discharge portion, wherein the controller is adapted to determine the presence/absence of a freeze through a comparison between a target driven value of the electrically driven component that is indicated by a drive command corresponding to electric power supplied
10 to the electrically-driven component and the actual driven value obtained during the operation of the electrically driven component.

 8. The fuel cell system according to claim 1, further comprising a defroster for defrosting a frozen component or portion of the fuel cell system, wherein the controller is
15 adapted to permit, when it is determined that the gas supply-discharge portion is not frozen but other component or portion of the fuel cell system is frozen, the start of the fuel cell system, and control the defroster to defrost the frozen component or portion using at least one of an electric power and heat generated during the power generation by the fuel cell system.

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 9. The fuel cell system according to claim 1, further comprising a notifier for providing a user with at least one of information regarding the determination made by the controller as to the presence/absence of a freeze in the fuel cell system and information selected in accordance with the result of the same determination.

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 10. The fuel cell system according to claim 9, wherein the notifier is formed by a display that provides the user with the information in the form of a message shown in a screen thereof.

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 11. The fuel cell system according to claim 9, wherein the notifier is adapted to provide the user with the information in the form of an audio indication.

 12. The fuel cell system according to claim 1, wherein the gas supply-discharge portion is formed by a valve, and the controller is adapted to determine the

presence/absence of a freeze in the valve on the basis of the number of steps taken for opening the valve.

13. The fuel cell system according to claim 1, further comprising a defroster for
5 defrosting a frozen component or portion of the fuel cell system and a battery,

wherein the controller is adapted to permit, when it is determined that the gas supply-discharge portion is not frozen but other component or portion of the fuel cell system is frozen, the start of the fuel cell system, and control the defroster to defrost the frozen component or portion using an electric power supplied from the battery.

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14. A method for controlling a fuel cell system including a gas supply-discharge portion for supplying a fuel cell with a gas used in power generation by the fuel cell or discharging an exhaust gas from the fuel cell, the method comprising the steps of:

determining the presence/absence of a freeze among specific portions or components
15 of the fuel cell system including the gas supply-discharge portion at the time of starting up the fuel cell system; and

prohibiting the start of the fuel cell system if a freeze is detected in at least one portion of the gas supply-discharge portion.

20 15. The method according to claim 14, wherein a temperature in at least one of the portions or components of the fuel cell system is detected, and

the presence of a freeze is determined if the temperature detected is below a reference value.

25 16. The method according to claim 14, wherein a pressure at the gas supply-discharge portion is detected, and

the presence/absence of a freeze is determined on the basis of the detected pressure.

17. A fuel cell system, comprising:

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a fuel cell;

a gas supply-discharge portion for supplying the fuel cell with a gas used in power generation by the fuel cell or discharging an exhaust gas from the fuel cell; and

controlling means which determines the presence/absence of a freeze among specific portions or components of the fuel cell system including the gas supply-discharge portion

at the time of starting up the fuel cell system, and which prohibits the start of the fuel cell system when a freeze is detected in the gas supply-discharge portion even if it is only partially frozen.

5 18. The fuel cell system according to claim 17, further comprising temperature detecting means for detecting a temperature in at least one of the portions or components of the fuel cell system,

 wherein the controlling means determines the presence of a freeze if the temperature detected by the temperature detecting means is below a reference value.

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 19. The fuel cell system according to claim 17, further comprising a pressure detecting means for detecting a pressure at the gas supply-discharge portion,

 wherein the controlling means determines the presence/absence of a freeze on the basis of the pressure detected by the pressure detecting means.

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 20. A motor-driven vehicle comprising the fuel cell system according to claim 1 as a power source.